Customer No.: 31561
Application No.: 10/711,509
Docket No.: 12405-US-PA-0P

REMARKS

Present Status of the Application

This is a full and timely response to the Advisory Action mailed on May 9, 2006. The Advisory Action maintains the rejections to claims 1-2, 4, 10, 19-20, 22, 24 under 35 U.S.C. 103(a) as being unpatentable over Wuu et al. (USP 6,222,214) in view of Lee et al (USP 6,737,305) and to claims 3, 5-7, 21, 23, 26-27 under 35 U.S.C. 103(a) as being unpatentable over Wuu in view of Lee and further in view of Yang et al. (US Publication 2002/0102781 A1).

Claims 1 and 19 have been amended. Upon entry of this response, claims 1-7, 10, 19-24, 26-27 remain pending. It is believed that no new matter is added by way of these amendments made to the claims or specification or otherwise to the application. Applicants further wish to clarify that the foregoing amendment has been made for the purpose of clarity and to make explicit that which already was implicit in the original claims, and therefore does not change or narrow the scope of the claims.

After carefully considering the remarks set forth in this Office Action and the cited references, Applicants respectfully submitted that the now pending claims are in condition for allowance. Reconsideration and withdrawal of the Examiner's rejection are requested.

Discussion of Office Action Rejections

Applicants respectfully traverse the rejection of claims 1-2, 4, 8, 10, 19-20, 22, 24-25 under 35 U.S.C. 103(a) as being unpatentable over Wuu et al. (USP 6,222,214) in

view of Lee et al (USP 6,737,305) because a prima facie case of obviousness has not been established by the Office Action.

When apply 35 U.S.C. 103, the following tenets of patent law must be adhered to:

(A) The claimed invention must be considered as a whole;

(B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;

(C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and

(D) Reasonable expectation of success is the standard with which obviousness is determined.

Hodosh v. Block Drug Co. Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n. 5 (Fed. Cir. 1986).

Applicant respectfully submits that the obviousness combination is based on the Office's opinion, not that from a person having ordinary skill in the art. The reasons that motivate the above position of the Applicant are discussed in detail hereafter. Wuu's invention, as a whole, teaches forming a SRAM wherein electrically conductive plugs are formed in the stacked contact openings to form ohmic connections between the P+ doped source/drain layer and a N+ doped gate layer. More specifically, Wuu teaches that the channel layer 18' of a P-channel TFT is formed with a relatively thin amorphous silicon layer 18 doped with N-type dopant such as (As) or (P). Wuu further teaches subjecting a portion of the amorphous silicon layer 18 to an ion implantation using a P type dopant to form the source/drain doped regions. Therefore, Wuu teaches that the source/drain and the

channel are formed of a same layer, and the source/drain regions are not formed over the channel layer to cover a portion of the channel layer as taught in the instant case. In addition, the source/drain and the channel are formed of a same layer and formed on the P-substrate 10 within the boundary of the insulating layer 12 as the SRAM Cell and to avoid the introduction of contaminants, such as sodium, into the oxide during the photolithograph and etching processes, resulting in unstable device properties which leads to a reduction of the on current (I_{on}) when the SRAM cell is switched to the opposite state, see col. 2 lines 32-56.

The Office, however, asserts that Lee teaches the missing feature. Applicant respectfully disagrees. Lee's invention, as a whole, is directed to improve the photoleakage current problem by forming a first and a second a-Si layers and a N+mixed a-Si layer. As discussed previously, Wuu's invention requires having the source/drain and the channel be formed of the same layer in order to provide for the P+/N- junctions between the FET channel and the source/drain areas, while Lee teaches forming source/drain regions on both sides of the channel layer 106. Accordingly, the motivation to combine Wuu with Lee is lacking since the proposed modification cannot render the prior art unsatisfactory for its intended purpose and the proposed modification cannot change the principle of operation of a reference. *See In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) and *In re Ratti*, 270 F. 2d 810, 123 USPQ 349 (CCPA 1959), respectively. The Office nevertheless argues in the Advisory Action that Lee is to provide to illustrate the contacts, and contacts attached to Wuu's source/drain implanted areas would not render the device inoperable. However, neither Wuu nor Lee teaches or suggests a source/drain contact that is being

formed to connect with the source/drain regions. Instead, both references simply teach forming the source/drain regions. Accordingly, there is nowhere in Wuu's teachings provides the motivation for the modification as proposed by the Office Action.

Moreover, neither Wuu nor Lee teaches the step of forming the channel layer, "wherein the channel layer is a lightly doped amorphous silicon layer" and the step of forming the channel layer comprising "forming a first lightly doped sub-amorphous silicon layer at a first deposition rate and forming a second lightly doped sub-amorphous silicon layer at a second deposition rate". Instead, Wuu teaches the channel layer 18' of a P-channel TFT is formed with a single thin doped amorphous silicon layer 18 of uniform properties formed under one deposition condition. Regarding Lee, Lee teaches the channel layer includes, in addition to an N+Mixed a-Si layer 106c, at least two undpoed first and second a-Si layers 106a, 106b. It is imperative for Lee to form the undoped a-Si layer in order to trap the photo leakage current generated in the channel layer (see Abstract). The present invention, however, does not teach any undoped a-Si layer as the channel layer. Therefore, Lee's channel layer is not just a light doped amorphous silicon layer as taught in the instant case because a channel layer without an undoped a Si-layer, in essence, teaches away Lee's invention. Accordingly, Lee fails to teach or suggest "the channel layer is a lightly doped amorphous silicon layer".

As stated In re Rouffet, 149, F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998), [t]here are three possible sources for a motivation to combine references : the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons or ordinary skill in the art. First of all, as discussed above, the nature of the

problems to be solved by Wuu and Lee are different from each other and further different from the instant case. Second, both prior art references have failed to teach or suggest key features in the claims, in which the channel layer of the instant case is a lightly doped amorphous silicon layer, and the step of forming the channel layer comprises: forming a first lightly doped sub-amorphous silicon layer over the portion of the inter-gate dielectric layer at a first deposition rate; and forming a second lightly doped sub-amorphous silicon layer over the first lightly doped sub-amorphous silicon layer at a second deposition rate. Further, the invention requires forming source/drain regions over the channel layer so as to cover a portion of the channel layer. Finally, the Examiner has not shown that a skilled artisan considering Wuu and Lee would have been motivated to combine or modify the references in a manner resulting in the recitations of claims 1 and 19 without benefit of Applicant's disclosure. In fact, Lee teaches away from Lee since Wuu requires the source/drain and the channel be formed from a same layer, while Lee teaches the channel be formed of different layers. Since no motivation is provided, one skilled in the art will not consider it obvious to use Lee to modify Wuu.

For at least the foregoing reasons, Applicants respectfully submit that independent claims 1 and 19 patently define over Wuu in view of Lee, and should be allowed. Since claims 2, 4, 8, 10, 20, 22, 24-25 are dependent claims, which further define the invention recited in claims 1 and 19, respectively, Applicants respectfully assert that these claims also are in condition for allowance.

Applicants respectfully traverse the rejection of claims 3, 5-7, 21, 13, 26 and 27 under 103(a) as being unpatentable over Wuu in view of Lee and further in view of Yang et al. (US Publication 2002/0102781, hereinafter "Yang") because a prima facie case of obviousness has not been established by the Office Action.

With regard to the 103 rejections of claims by Wuu in view of Lee and further in view of Yang, Applicants respectfully submit that these claims defined over the prior art references for at least the reasons discussed above.

As taught in the claimed invention, the effective content ratio of phosphine or boroethane is critical in the process of forming the channel layer having the desirable turning-on-current and the electron mobility properties. For at least the reason the neither Wuu, Lee nor Yang teaches or suggests the claimed concentration of dopants or the ratio of the reactants as recited in claims 4-7 & 23-24, 26-27, Applicants submit that the rejections to claims 3, 5-7, 21, 13, 26 and 27 have been traversed, rendered moot, and/or accommodated, and that the pending claims 3, 5-7, 21, 13, 26 and 27 are in condition for allowance. Favorable consideration and allowance of the present application and all pending claims are hereby courteously requested.

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CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims of the present application patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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Respectfully submitted,

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